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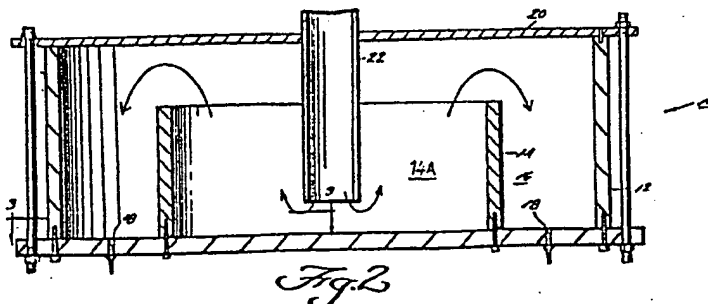
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(54) **Apparatus for uniformly distributing liquid or foam.**

(57) A closed cylindrical housing is provided with a first cylindrical member secured to the bottom of the housing. A second cylindrical member concentric with, but of lesser diameter than, the first member passes through a housing cap. The second member terminates in spaced relationship with the bottom of the housing. Liquid or foam supplied to the interior of the housing through the second member rises between the first and second cylindrical members and enters an annular space defined between the first member and the cylindrical housing. A plurality of spaced apertures in the housing communicate with the annular space and serve as outlets for the discharge of liquid or foam.



APPARATUS FOR UNIFORMLY DISTRIBUTING  
LIQUID OR FOAM

BACKGROUND OF THE INVENTION

When applying liquids or foams to relatively wide materials, as in the finishing and dyeing of fabrics or carpeting, it is critical that such substances be uniformly distributed to the applicator. Typically, 5 the latter is an inclined plane or a curved surface onto which a film of the liquid or foam is deposited so as to move under the force of gravity and fall onto the wide material passing beneath the applicator. Alternatively, an array of spray nozzles, or an elongated manifold with plural apertures, extends across 10 the width of the material, and the liquid or foam is directed from the nozzles or apertures onto the material being treated.

Should there be a lack of uniformity in the supply of liquid or foam to applicators of the type just 15 described, an uneven treatment of the material occurs. This produces an objectionable product. An example of this -- in the case where the applied substance is a dye -- is a material which is streaked or which has 20 color gradations and/or imperfect patterns.

SUMMARY OF THE INVENTION

Briefly, the invention comprises an arrangement wherein a closed cylindrical housing includes a first cylindrical member secured to the bottom of the housing.

5 A second cylindrical member passes through a housing cap. This second member is concentric with, but of lesser diameter than, the first cylindrical member, and it terminates at a location spaced from the bottom of the housing. An annular space is defined between the first  
10 cylindrical member and the housing, and a plurality of apertures which communicate with the annular space are provided in the housing. Liquid or foam supplied under pressure to the interior of the housing through the second cylindrical member is uniformly discharged from  
15 the housing through the apertures to separate conduits leading to an applicator.

The invention also includes apparatus for distributing liquid or foam comprising a closed housing, a first member located within the housing to form a trough between  
20 the housing and the member and to form a cavity encircled by the member which forms a weir between the cavity and the trough, an inlet passing through the closed housing and into the cavity and terminating in the cavity at a position below the weir member, and a plurality of outlets  
25 comprising spaced apertures arranged in the housing for communication with the trough.

Preferably, the closed housing and the member are

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each cylindrical and the trough therebetween is annular.

#### DETAILS OF THE INVENTION

The invention will be described in greater detail with respect to the accompanying drawings, wherein:

5        Figure 1 is a perspective view of a liquid or foam distributor according to the invention, the distributor being joined to a typical applicator for treating a width of moving material;

10        Figure 2 is an enlarged view in section of the distributor, taken along line 2-2 of Figure 1; and

      Figure 3 is a fragmented sectional view of the distributor, taken along line 3-3 of Figure 2.

      Referring to Figure 1, liquid or foam under pressure is directed to a distributor 10. As can be appreciated  
15        from Figures 2 and 3, the distributor 10 comprises a cylindrical housing 12 containing a further cylindrical member 14 concentric with the axis of the housing but of lesser diameter so as to define an annular trough or space 16 between member 14 and the interior of housing  
20        12. The cylindrical member 14 forms a weir between the trough or space 16 and cavity 14A. Within space 16, at the bottom of the housing 12, a ring of spaced discharge apertures 18 is provided. The top of housing 12 is covered by a cap 20. A tubular member 22 passes through  
25        cap 20 and terminates within the cylindrical member 14 at a location spaced from the bottom of the housing. Member 22 is concentric with housing 12 and member 14, and it has a diameter smaller than that of member 14.

Liquid or foam under pressure passes downwardly through the tube 22, upwardly between the tube and member 14, and then downwardly between member 14 and the interior of the housing so as to be discharged from the distributor 5 10 through apertures 18. Since the housing 12 is sealed, the liquid or foam is forced evenly through each of apertures 18.

The representative applicator 24 shown in Figure 1 comprises a closed end pipe 26 joined to the distributor 10 10 by means of a plurality of conduits 28 each connected to a separate aperture 18 of the distributor. The applicator 24 is provided with a plurality of apertures 30 spaced along its length from which the liquid or foam exits onto an inclined surface 32. The film of liquid 15 or foam produced on surface 32 moves under the force of gravity to the lower edge of the inclined surface from which it falls onto the web of material 34 moving past the applicator.

It is critical that the applicator be provided with 20 a uniform supply of material along its length. The distributor which has been described insures that this occurs even with foam, a material which has a tendency not to move laterally.

While the applicator illustrated in Figure 1 comprises an elongated manifold associated with an inclined surface, it will be apparent that a distributor made in accordance with the present invention may be employed with a variety of other types of applicators such as

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an array of spray nozzles, curved blades, slotted pipes,  
or the like.

## WHAT IS CLAIMED IS:

1. Apparatus for uniformly distributing liquid or foam, comprising:

a closed cylindrical housing;

a first cylindrical member located within said housing and secured to a bottom of the housing, said first member being dimensioned to define an annular space between the member and the housing;

a second cylindrical member passing through a cap which forms a top of the housing, said second member being concentric with the first cylindrical member and having a lesser diameter than said first member, said second cylindrical member terminating within the first member at a location spaced from the bottom of the housing and being adapted to introduce the liquid or foam to the interior of said housing; and

a plurality of outlets comprising spaced apertures arranged in the housing so as to communicate with said annular space.

2. Apparatus as set forth in Claim 1, wherein said spaced apertures are arranged in a ring in the bottom of the housing.

3. Apparatus for distributing liquid or foam comprising a closed housing, a first member located within the housing to form a trough between the housing and the member and to form a cavity encircled by the member which forms a weir between the cavity and the trough,

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an inlet passing through the closed housing and into the cavity and terminating in the cavity at a position below the weir member, and a plurality of outlets comprising spaced apertures arranged in the housing for communication  
5 with the trough.

4. Apparatus according to claim 2 wherein the closed housing and the member are each cylindrical and the trough therebetween is annular.

5. Apparatus according to claim 3 or claim 4 wherein  
10 the inlet is a cylindrical tube passing through a cap which forms a top of the closed housing, the cylindrical inlet tube being concentric with the cylindrical member and terminating within the cavity formed by the cylindrical member, at a location spaced from the bottom of the housing.

15 6. Apparatus according to any one of claims 3, 4 or 5 wherein the spaced apertures are arranged in a ring in the bottom of the trough.



Fig. 1

